October 15, 1999 / Vol. 48 / No. 40

MORBIDITY AND MORTALITY
WEEKLY REPORT

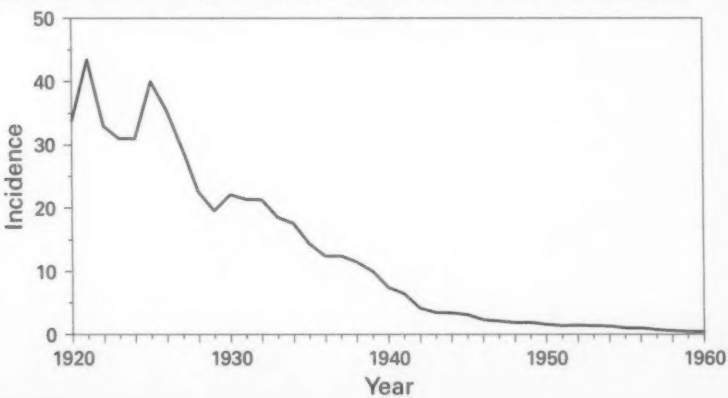
Printed and distributed by the Massachusetts Medical Society, publishers of *The New England Journal of Medicine*

Achievements in Public Health, 1900–1999

Safer and Healthier Foods

During the early 20th century, contaminated food, milk, and water caused many foodborne infections, including typhoid fever, tuberculosis, botulism, and scarlet fever. In 1906, Upton Sinclair described in his novel *The Jungle* the unwholesome working environment in the Chicago meat-packing industry and the unsanitary conditions under which food was produced. Public awareness dramatically increased and led to the passage of the Pure Food and Drug Act (*1*). Once the sources and characteristics of foodborne diseases were identified—long before vaccines or antibiotics—they could be controlled by handwashing, sanitation, refrigeration, pasteurization, and pesticide application. Healthier animal care, feeding, and processing also improved food supply safety. In 1900, the incidence of typhoid fever was approximately 100 per 100,000 population; by 1920, it had decreased to 33.8, and by 1950, to 1.7 (Figure 1). During the 1940s, studies of autopsied muscle samples showed that 16% of persons

FIGURE 1. Incidence* of typhoid fever, by year — United States, 1920–1960



*Per 100,000 population.

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in the United States had trichinellosis; 300–400 cases were diagnosed every year, and 10–20 deaths occurred (*2*). Since then, the rate of infection has declined markedly; from 1991 through 1996, three deaths and an average of 38 cases per year were reported (*3*).

Nutritional sciences also were in their infancy at the start of the century. Unknown was the concept that minerals and vitamins were necessary to prevent diseases caused by dietary deficiencies. Recurring nutritional deficiency diseases, including rickets, scurvy, beri-beri, and pellagra were thought to be infectious diseases. By 1900, biochemists and physiologists had identified protein, fat, and carbohydrates as the basic nutrients in food. By 1916, new data had led to the discovery that food contained vitamins, and the lack of "vital amines" could cause disease. These scientific discoveries and the resulting public health policies, such as food fortification programs, led to substantial reductions in nutritional deficiency diseases during the first half of the century. The focus of nutrition programs shifted in the second half of the century from disease prevention to control of chronic conditions, such as cardiovascular disease and obesity.

Food Safety

Perishable foods contain nutrients that pathogenic microorganisms require to reproduce. Bacteria such as *Salmonella* sp., *Clostridium* sp., and *Staphylococcus* sp. can multiply quickly to sufficient numbers to cause illness. Prompt refrigeration slows bacterial growth and keeps food fresh and edible.

At the turn of the 20th century, consumers kept food fresh by placing it on a block of ice or, in cold weather, burying it in the yard or storing it on a window sill outside. During the 1920s, refrigerators with freezer compartments became available for household use. Another process that reduced the incidence of disease was invented by Louis Pasteur—pasteurization. Although the process was applied first in wine preservation, when milk producers adopted the process, pasteurization eliminated a substantial vector of foodborne disease (see box, page 907). In 1924, the Public Health Service created a document to assist Alabama in developing a statewide milk sanitation program. This document evolved into the Grade A Pasteurized Milk Ordinance, a voluntary agreement that established uniform sanitation standards for the interstate shipment of Grade A milk and now serves as the basis of milk safety laws in the 50 states and Puerto Rico (*4*).

Along with improved crop varieties, insecticides and herbicides have increased crop yields, decreased food costs, and enhanced the appearance of food. Without proper controls, however, the residues of some pesticides that remain on foods can create potential health risks (*5*). Before 1910, no legislation existed to ensure the safety of food and feed crops that were sprayed and dusted with pesticides. In 1910, the first pesticide legislation was designed to protect consumers from impure or improperly labeled products. During the 1950s and 1960s, pesticide regulation evolved to require maximum allowable residue levels of pesticides on foods and to deny registrations for unsafe or ineffective products. During the 1970s, acting under these strengthened laws, the newly formed Environmental Protection Agency (EPA) removed DDT and several other highly persistent pesticides from the marketplace. In 1996, the Food Quality Protection Act set a stricter safety standard and required the review of older allowable residue levels to determine whether they were safe. In 1999,

Safer and Healthier Foods — Continued

Milton J. Rosenau, M.D.

Few public health issues are more public than food safety, which can involve health officials, farmers, manufacturers, and consumers. Milton J. Rosenau played a crucial role in the long, contentious campaign to make milk supplies pure and safe in the United States. As researcher, health official, and educator, Rosenau put medical science to work in the service of preventive medicine and public health.

Rosenau was born in Philadelphia on January 1, 1869, and received his medical degree from the University of Pennsylvania in 1889. In 1890, he joined the United States Marine Hospital Service (MHS). He served as quarantine officer in San Francisco from 1895–1898 and in Cuba in 1898. During 1899–1909, he directed the MHS Hygienic Laboratory, transforming a one-person operation into a bustling institution with divisions in bacteriology, chemistry, pathology, pharmacology, zoology, and biology. Rosenau conducted his most important medical research during his 10 years at the Hygienic Laboratory, publishing many articles and books, including *The Milk Question* (1912) and *Preventive Medicine and Hygiene* (1913), which quickly became the most influential textbook on the subject.

From early in his career, campaigns to reduce milkborne diseases occupied Rosenau's attention. As he stated in his textbook, "Next to water purification, pasteurization is the most important single preventive measure in the field of sanitation." A Public Health Service study in 1909 reported that 500 outbreaks of milkborne diseases had occurred during 1880–1907. By 1900, increasing numbers of children drank pasteurized milk, but raw milk remained the norm partly because the high-temperature process then in use imparted a "cooked milk" taste. In 1906, Rosenau established that low temperature, slow pasteurization (140 F [60 C] for 20 minutes) killed pathogens without spoiling the taste, thus eliminating a key obstacle to public acceptance of pasteurized milk. However, securing a safe milk supply nationwide took another generation. By 1936, pasteurized, certified milk was the standard in most large cities, although over half of all milk in the United States was still consumed raw.

In 1913, Rosenau became a Harvard University Medical School professor and a co-founder of the Harvard and Massachusetts Institute of Technology School for Health Officers. When Harvard established a school of public health in 1922, Rosenau directed its epidemiology program until 1935. In 1936, he moved to the University of North Carolina, Chapel Hill, to help establish its public health school (1940), where he served as dean until his death in 1946.

Rosenau was a dedicated teacher and advocate for improved training in preventive medicine, but he is better remembered for his textbook than his pioneering epidemiologic work. This is as he expected: "We find monuments erected to heroes who have won wars, but we find none commemorating anyone's preventing a war. The same is true with epidemics."

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federal and state laws required that pesticides meet specific safety standards; the EPA reviews and registers each product before it can be used and sets levels and restrictions on each product intended for food or feed crops.

Newly recognized foodborne pathogens have emerged in the United States since the late 1970s; contributing factors include changes in agricultural practices and food processing operations, and the globalization of the food supply (Table 1). Seemingly healthy food animals can be reservoirs of human pathogens. During the 1980s, for example, an epidemic of egg-associated *Salmonella* serotype Enteritidis infection spread to an estimated 45% of the nation's egg-laying flocks, which resulted in a large increase in egg-associated foodborne illness within the United States (*6,7*). *Escherichia coli* O157:H7, which can cause severe infections and death in humans, produces no signs of illness in its nonhuman hosts (*8*). In 1993, a severe outbreak of *E. coli* O157:H7 infections attributed to consumption of undercooked ground beef (*9*) resulted in 501 cases of illness, 151 hospitalizations, and three deaths, and led to a restructuring of the meat inspection process. The most common foodborne infectious agent may be the calicivirus (a Norwalk-like virus), which can pass from the unwashed hands of an infected foodhandler to the meal of a consumer. Animal husbandry and meat production improvements that have contributed to reducing pathogens in the food supply include pathogen eradication campaigns, the Hazard Analysis and Critical Control Point (HACCP) programs (*10*), better animal feeding regulations (*11*), the use of uncontaminated water in food processing (*12*), more effective food preservatives (*13*), improved antimicrobial products for sanitizing food processing equipment and facilities, and adequate surveillance of foodhandling and preparation methods (*14*). HACCP programs also are mandatory for the seafood industry (*15*).

Improved surveillance, applied research, and outbreak investigations have elucidated the mechanisms of contamination that are leading to new control measures for foodborne pathogens. In meat-processing plants (*16*), the incidence of *Salmonella* and *Campylobacter* infections has decreased. However, in 1998, apparently unrelated

TABLE 1. Newly recognized pathogens identified as predominantly foodborne

Campylobacter coli
Campylobacter jejuni
Campylobacter fetus ssp. *fetus*
Cryptosporidium parvum
Cyclospora cayetanensis
Escherichia coli O157:H7 and related *E. coli* (e.g., O111:NM and O104:H21)
Listeria monocytogenes
Norwalk-like viruses
Nitschia pungens (cause of amnesic shellfish poisoning)
Salmonella serotype Enteritidis
Salmonella serotype Typhimurium DT 104
Vibrio cholerae Non-O1
Vibrio vulnificus
Vibrio parahaemolyticus
Yersinia enterocolitica

Safer and Healthier Foods — Continued

cases of *Listeria* infections were linked when an epidemiologic investigation indicated that isolates from all cases shared the same genetic DNA fingerprint; approximately 100 cases and 22 deaths were traced to eating hot dogs and deli meats produced in a single manufacturing plant (*17*). In 1998, a multistate outbreak of shigellosis was traced to imported parsley (*18*). During 1997–1998 in the United States, outbreaks of cyclosporiasis were associated with mesclun mix lettuce, basil/basil-containing products, and Guatemalan raspberries (*19*). These instances highlight the need for measures that prevent food contamination closer to its point of production, particularly if the food is eaten raw or is difficult to wash (*20*).

Any 21st century improvement will be accelerated by new diagnostic techniques and the rapid exchange of information through use of electronic networks and the Internet. PulseNet, for example, is a network of laboratories in state health departments, CDC, and food regulatory agencies. In this network, the genetic DNA fingerprints of specific pathogens can be identified and shared electronically among laboratories, enhancing the ability to detect, investigate, and control geographically distant yet related outbreaks. Another example of technology is DPDx, a computer network that identifies parasitic pathogens. By combining PulseNet and DPDx with field epidemiologic investigations, the public health system can rapidly identify and control outbreaks. CDC, the Food and Drug Administration, the U.S. Department of Agriculture (USDA), other federal agencies, and private organizations are enhancing food safety by collaborating in education, training, research, technology, and transfer of information and by considering food safety as a whole—from farm to table.

Nutrition

The discovery of essential nutrients and their roles in disease prevention has been instrumental in almost eliminating nutritional deficiency diseases such as goiter, rickets, and pellagra in the United States. During 1922–1927, with the implementation of a statewide prevention program, the goiter rate in Michigan fell from 38.6% to 9.0 % (*21*). In 1921, rickets was considered the most common nutritional disease of children, affecting approximately 75% of infants in New York City (*22*). In the 1940s, the fortification of milk with vitamin D was a critical step in rickets control.

Because of food restrictions and shortages during the first world war, scientific discoveries in nutrition were translated quickly into public health policy; in 1917, USDA issued the first dietary recommendations based on five food groups; in 1924, iodine was added to salt to prevent goiter. The 1921–1929 Maternal and Infancy Act enabled state health departments to employ nutritionists, and during the 1930s, the federal government developed food relief and food commodity distribution programs, including school feeding and nutrition education programs, and national food consumption surveys.

Pellagra is a good example of the translation of scientific understanding to public health action to prevent nutritional deficiency. Pellagra, a classic dietary deficiency disease caused by insufficient niacin, was noted in the South after the Civil War. Then considered infectious, it was known as the disease of the four Ds: diarrhea, dermatitis, dementia, and death. The first outbreak was reported in 1907. In 1909, more than 1000 cases were estimated based on reports from 13 states. One year later, approximately 3000 cases were suspected nationwide based on estimates from 30 states and the District of Columbia. By the end of 1911, pellagra had been reported in all but nine

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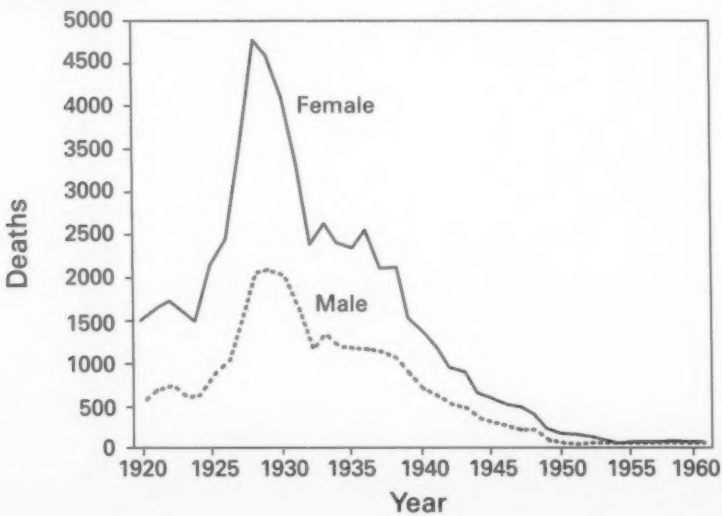
states, and prevalence estimates had increased nearly ninefold (*23*). During 1906–1940, approximately 3 million cases and approximately 100,000 deaths were attributed to pellagra (*24*). From 1914 until his death in 1929, Joseph Goldberger, a Public Health Service physician, conducted groundbreaking studies that demonstrated that pellagra was not infectious but was associated with poverty and poor diet. Despite compelling evidence, his hypothesis remained controversial and unconfirmed until 1937. The near elimination of pellagra by the end of the 1940s (Figure 2) has been attributed to improved diet and health associated with economic recovery during the 1940s and to the enrichment of flour with niacin. Today, most physicians in the United States have never seen pellagra although outbreaks continue to occur, particularly among refugees and during emergencies in developing countries (*25*).

The growth of publicly funded nutrition programs was accelerated during the early 1940s because of reports that 25% of draftees showed evidence of past or present malnutrition; a frequent cause of rejection from military service was tooth decay or loss. In 1941, President Franklin D. Roosevelt convened the National Nutrition Conference for Defense, which led to the first recommended dietary allowances of nutrients, and resulted in issuance of War Order Number One, a program to enrich wheat flour with vitamins and iron. In 1998, the most recent food fortification program was initiated; folic acid, a water-soluble vitamin, was added to cereal and grain products to prevent neural tube defects.

While the first half of the century was devoted to preventing and controlling nutritional deficiency disease, the focus of the second half has been on preventing chronic

FIGURE 2. Number of reported pellagra deaths, by sex of decedent and year — United States, 1920–1960



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disease with initiation of the Framingham Heart Study in 1949. This landmark study identified the contribution of diet and sedentary lifestyles to the development of cardiovascular disease, and the effect of elevated serum cholesterol on the risk for coronary heart disease. With increased awareness, public health nutrition programs have sought strategies to improve diets. By the 1970s, food and nutrition labeling and other consumer information programs stimulated the development of products low in fat, saturated fat, and cholesterol. Since then, persons in the United States have significantly decreased their dietary intakes of total fat from approximately 40% of total calorie intake in 1977–1978 to 33% in 1994–1996, approaching the recommended 30% (*26*); saturated fat intake and serum cholesterol levels also have decreased (*27*). Prevention efforts, including changes in diet (*28*) and lifestyle and early detection and improved treatment, have contributed to impressive declines in mortality from heart disease and stroke (*29*).

Populations with diets rich in fruits and vegetables have a substantially lower risk for many types of cancer. In 1991, the National Cancer Institute and the Produce for Better Health Foundation launched a program to encourage eating at least five servings of fruits and vegetables daily. Although public awareness of the "5 A Day" message has increased, only approximately 36% of persons in the United States aged ≥2 years achieved the daily goal of five or more servings of fruits and vegetables (*28*). A diet rich in fruits and vegetables that provide vitamins, antioxidants (including carotenoids), other phytochemicals, and fiber is associated with additional health benefits, including decreased risk for cardiovascular disease.

The most urgent challenge to nutritional health during the 21st century will be obesity. In the United States, with an abundant, inexpensive food supply and a largely sedentary population, overnutrition has become an important contributor to morbidity and mortality in adults. As early as 1902, USDA's W.O. Atwater linked dietary intake to health, noting that "the evils of overeating may not be felt at once, but sooner or later they are sure to appear—perhaps in an excessive amount of fatty tissue, perhaps in general debility, perhaps in actual disease" (*30*). In U.S. adults, overweight (body mass index [BMI] of ≥25 kg/m^2) and obesity (BMI ≥30 kg/m^2) have increased markedly, especially since the 1970s. In the third National Health and Nutrition Examination Survey (NHANES III, 1988–1994), the crude prevalence of overweight for adults aged ≥20 years was 54.9%. From 1976–1980 (NHANES II) to 1988–1994 (NHANES III), the prevalence of obesity increased from 14.5% to 22.5% (*31*).

Overweight and obesity increase risk for and complications of hypertension, hyperlipidemia, diabetes, coronary heart disease, osteoarthritis, and other chronic disorders; total costs attributable to obesity are an estimated $100 billion annually (*32*). Obesity also is a growing problem in developing countries where it is associated with substantial morbidity and where malnutrition, particularly deficiencies of iron, iodine, and vitamin A, affects approximately 2 billion people. Increasing physical activity in the U.S. population is an important step (*33*), but effective prevention and control of overweight and obesity will require concerted public health action.

As the U.S. population ages, attention to both nutrition and food safety will become increasingly important. Challenges will include maintaining and improving nutritional status, because nutrient needs change with aging, and assuring food quality and safety, which is important to an older, more vulnerable population. Continuing challenges for public health action include reducing iron deficiency, especially in infants,

Safer and Healthier Foods — Continued

young children, and women of childbearing age; improving initiation and duration of breastfeeding; improving folate status for women of childbearing age; and applying emerging knowledge about nutrition on dietary patterns and behavior that promote health and reduce risk for chronic disease. Behavioral research indicates that successful nutrition promotion activities focus on specific behaviors, have a strong consumer orientation, segment and target consumers, use multiple reinforcing channels, and continually refine the messages (*34*). These techniques form a paradigm to achieve public health goals and to communicate and motivate consumers to change their behavior.

Reported by: Environmental Protection Agency. United States Department of Agriculture. Center for Food Safety and Applied Nutrition, Food and Drug Administration. Div of Nutrition Research Coordination, National Institutes of Health. National Center for Health Statistics; National Center for Environmental Health; National Center for Infectious Diseases; National Center for Chronic Disease Prevention and Health Promotion, CDC.

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Folic Acid Campaign and Evaluation — Southwestern Virginia, 1997–1999

A needs assessment conducted in rural southwestern Virginia in 1996 indicated higher rates of birth defects in that region than in the entire state (*1*). In response to these findings, in January 1997 the regional perinatal council conducted a community folic acid information campaign designed to raise awareness about the 1992 Public Health Service recommendation that all women who are capable of becoming pregnant consume 400 µg (0.4 mg) of the B vitamin folic acid every day to decrease their risk for having a pregnancy affected with spina bifida or other neural tube defects (NTDs) (*2*). This report describes the information campaign and the findings from precampaign and postcampaign surveys, which showed a significant increase in reported awareness and knowledge of the benefits of folic acid and reported knowledge about the sources of folic acid.

During 1997, a year-long community information campaign targeted an estimated 22,500 women of childbearing age in a four-county area of southwestern Virginia. The campaign included television and radio public service announcements (PSAs), a news conference, newspaper advertisements, and billboards. The television and radio PSAs used actors from the local theater and local broadcasting students. Printed materials included brochures, posters, information cards, food labels, flyers, banners, and display boards. Focus groups and readability tests were conducted to help develop print materials. A local grocery store chain helped promote the use of folate-dense foods, folic acid vitamin supplements, fortified cereals, and multivitamin supplements by having volunteers specially label specific foods and hand out educational materials. Volunteers also distributed green ribbons in the communities to promote folic acid awareness. Local school board members and teachers developed a folic acid teaching packet for use in health education and biology classes for students in grades 5–12 and college-level nursing programs.

The campaign activities and results were evaluated using precampaign and postcampaign random sample telephone surveys to assess folic acid awareness and knowledge. The precampaign survey, conducted during January 1997, included 412 women aged 18–45 years chosen by a systematic random sample of listed telephone numbers. The postcampaign telephone surveys were conducted during January 1998 (n=419) and February 1999 (n=278), using identical survey methods and an additional question about the source of folic acid information.

Based on responses to the question "Have you heard about the benefits of folic acid?", reported awareness increased significantly, from 31% in 1997 (precampaign) to 54% in 1998 (postcampaign), and to 75% in 1999 (sustainability survey) ($p<0.05$, chi-square test) (Table 1). Among women who reported hearing about the benefits of folic acid, the proportion who correctly answered that one benefit of folic acid was to help prevent certain birth defects increased from 77% in 1997 to 81% in 1998 and to 88% in 1999. Among women who reported in the postcampaign survey that they had heard about folic acid, knowledge about ways to increase consumption increased from 55% in 1997 to 73% in 1999, but correct knowledge about the best time to take folic acid (before or during pregnancy) did not increase. Women who had heard of folic acid cited television and health-care providers as the two leading sources of information.

Folic Acid Campaign — Continued

Reported by: K Broome, MPH, Region I Perinatal Coordinating Council of Abingdon, Virginia. Div of Birth Defects, Child Development, and Disability and Health, National Center for Environmental Health, CDC.

Editorial Note: National surveys indicate that awareness of folic acid among reproductive-aged women increased from 52% in 1995 to 68% in 1998, although increases in use of folic acid-containing vitamins were modest, from 28% to 32% (*3*). Increasing the number of women who consume 400 µg of folic acid per day depends on the success of national and local health communication campaigns. The campaign described in this report demonstrated that with limited resources, community volunteers and campaign staff were able to use qualitative formative research methods to develop health communication materials, enlist the assistance of private- and public-sector community partners, and survey women about folic acid knowledge and awareness in this community.

The findings of the surveys in southwestern Virginia are subject to at least four limitations. First, the changes in awareness and knowledge might have resulted from other national media efforts rather than the local campaign. Second, because the survey did not collect information about characteristics such as age, parity, or pregnancy intention, different awareness and knowledge levels among these subsets of reproductive-aged women cannot be assessed. For example, awareness and knowledge could have increased more among women who were planning a pregnancy than among women not planning a pregnancy. Third, the women in the counties surveyed may not be representative of reproductive-aged women in this age group in this region of Virginia or in the United States. Finally, an increase in knowledge is an intermediate outcome and may not be related directly to an increase in intake of folic acid or a decrease in the occurrence of NTDs. For example, women knowledgeable about the benefits of folic acid may have other barriers to changing their behavior to increase consumption. To overcome these barriers, women need both knowledge and resources to make and sustain behavior change, particularly for an active modification such as daily vitamin consumption (*4*).

Another method to facilitate increased folic acid intake without relying solely on active behavior change is through food fortification. Since January 1998, "enriched" cereal grain products must be fortified with folic acid at a level of 140 µg per 100 g of cereal grain product (*5*). Fortification will increase folic acid consumption among reproductive-aged women, but many women will still consume <400 µg of synthetic folic acid daily (*6*). In 1998, the Institute of Medicine recommended that women capable of becoming pregnant take 400 µg of synthetic folic acid daily from fortified foods and/or supplements in addition to consuming food folate from a varied diet (*7*). Women are advised to consume foods fortified with folic acid (e.g., breakfast cereals, enriched breads, and pastas) in addition to a balanced diet including folate-dense foods, such as leafy green vegetables, orange juice, and beans. Use of supplements containing folic acid, even though it requires a behavior change, remains a convenient way to assure consumption of 400 µg daily.

Despite the limitations of survey methods used in the study in southwestern Virginia, the relatively low cost and ease of implementation made such a survey feasible in this community evaluation. Other more objective evaluation methodologies for folic acid interventions include measurements of blood folate levels and monitoring the rates of NTD-affected pregnancies. Preintervention and postintervention blood folate

Folic Acid Campaign — Continued

TABLE 1. Assessment of knowledge related to folic acid among childbearing-aged women before and after an education campaign and to assess sustainability of knowledge — southwestern Virginia, 1997, 1998, and 1999

Question	1997 (precampaign)				1998 (postcampaign)				1999 (sustainability)			
	No. respondents	Responses			No. respondents	Responses			No. respondents	Responses		
		No.	(%)	(95% CI*)		No.	(%)	(95% CI)		No.	(%)	(95% CI)
1. Have you heard about the benefits of folic acid?												
Answer: Yes	412	128	(31)	(27%–36%)	419	226	(54)	(49%–59%)	278	207	(75)	(69%–80%)†
2. What is one benefit of folic acid?§												
Answer: It helps prevent certain birth defects	128	98	(77)	(68%–84%)	226	184	(81)	(76%–86%)	207	183	(88)	(83%–92%)†
3. When is the best time to take more folic acid?¶												
Answer: Before you become pregnant	98	85	(87)	(78%–93%)	184	150	(82)	(75%–87%)	183	162	(89)	(83%–93%)
4. What are ways to take in more folic acid?¶,**												
Answer: Eat more foods such as broccoli, legumes, cereal and orange juice	98	83	(85)	(76%–91%)	184	157	(85)	(79%–91%)	183	167	(91)	(86%–95%)†
Answer: Take a daily multivitamin with folic acid	98	63	(64)	(54%–74%)	184	135	(73)	(66%–80%)	183	145	(79)	(73%–85%)†
Answer: Use both folate-rich foods and multivitamins	98	54	(55)	(45%–65%)	184	115	(63)	(55%–70%)	183	134	(73)	(66%–80%)†
5. Where did you hear about folic acid?,††**												
Television	—				184	108	(59)	(51%–66%)	206	89	(43)	(36%–50%)§§
Health-care provider	—				184	52	(28)	(22%–35%)	206	56	(27)	(21%–34%)
Other¶¶	—				184	36	(20)	(14%–26%)	206	20	(10)	(6%–15%)§§
Posters or brochures	—				184	29	(16)	(11%–22%)	206	10	(5)	(2%– 9%)§§
Health department	—				184	21	(11)	(7%–17%)	206	9	(4)	(2%– 8%)§§
School	—				184	15	(8)	(5%–13%)	206	7	(3)	(1%– 7%)§§
Friend or relative	—				184	13	(7)	(4%–12%)	206	10	(5)	(2%– 9%)
Radio	—				184	6	(3)	(1%– 7%)	206	2	(1)	(0%– 4%)
Billboard	—				184	5	(3)	(1%– 6%)	206	3	(2)	(1%– 4%)

*Confidence interval.
†Significant change from 1997 to 1999 ($p<0.05$).
§Asked only of those who answered yes to question 1.
¶Asked only of those who chose the correct answer to question 2.
**The sum of the percentages does not equal 100% because of multiple responses in the survey.
††Not asked in 1997 survey.
§§Significant change from 1998 to 1999 ($p<0.05$).
¶¶Specified as, but not limited to, newspapers and magazines.

Folic Acid Campaign — Continued

levels can be used to assess the effectiveness of interventions at the community level but require substantial resources to obtain and measure the blood samples. On the national level, blood folate measurements collected in the National Health and Nutrition Examination Survey can be used to evaluate the impact of interventions. Accurate NTD monitoring requires the inclusion of affected pregnancies that were prenatally detected to assess the impact of consuming folic acid independent from that of the increasing use of prenatal diagnosis. The large population size necessary to detect a change in NTD rates limits the use of NTD rate monitoring to evaluate local campaigns, although NTD data from several states or communities can be combined to assess the impact of interventions in larger populations.

NTDs occur very early in pregnancy. Because more than 50% of pregnancies in the United States are mistimed or unplanned (*8*), it is especially important to increase women's knowledge about the importance of consuming folic acid before pregnancy. In 1999, CDC, the National March of Dimes Birth Defects Foundation, and the National Council on Folic Acid began a national education campaign with materials targeted to women who are thinking about pregnancy ("Before You Know It") and to women who are able to get pregnant even though they are not planning on it in the near future ("Ready, Not"). The campaign includes a series of PSAs and other outreach activities to women of reproductive age and to health-care providers.

More experience is needed in implementing and evaluating folic acid campaigns to determine which interventions are most effective. States and communities are encouraged to share their experiences and lessons learned with other states and communities that are planning interventions. The folic acid education campaign in Virginia is one of several examples included in a resource guide for folic acid campaigns (*9*). The resource guide and other educational materials on folic acid are available by contacting CDC by e-mail, flo@cdc.gov, or by telephone, (888) 232-6789.

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Self-Reported Asthma in Adults and Proxy-Reported Asthma in Children — Washington, 1997–1998

Increased awareness of asthma as a public health problem reflects recent increases in asthma prevalence, asthma-related visits to hospital emergency departments, and asthma-related mortality (*1*). To assess the prevalence of asthma in Washington, the Washington State Department of Health added survey items on asthma to its 1997 and 1998 Behavioral Risk Factor Surveillance System (BRFSS) survey. This report summarizes the results of those surveys, which indicate that persons with asthma reported significantly lower health status than other respondents and that a substantial proportion of households with children reported having a child with asthma.

BRFSS is a state-based, random-digit–dialed survey of the noninstitutionalized population aged ≥18 years; the survey collects information about modifiable risk factors for chronic diseases and other leading causes of death. CDC and state and territorial departments of health use the system to measure achievement toward both national and state health objectives.

BRFSS respondents were asked "Has a doctor or other health care professional ever told you that you have asthma?" and "How old were you the first time this happened?" These questions were followed by "Has a doctor ever said that one of the children currently living in your household has asthma?" and, if yes, "How old is this child (are these children)?"

The number of respondents was 3604 both in 1997 and 1998. To improve the precision of estimates, data from the two survey years were combined. Except for the estimated number of children with asthma in the population, prevalence estimates and 95% confidence intervals (CIs) were calculated using weighted data to adjust for sample design. The number of children with asthma was stratified by age and its 95% CI was calculated on pooled unweighted data.

Among adults, 10.8% reported having had asthma at some point in their life (i.e., ever asthma), and the median age at onset was 19 years (range: 1–81 years). Persons with asthma reported significantly lower health status than other respondents: 18.8% (95% CI=15.8%–21.8%) reported fair or poor health, compared with 9.9% (95% CI=9.1%–10.7%) of those not reporting asthma. The number of adults with asthma in Washington was an estimated 450,000 (95% CI=413,000–479,000).

At least one child aged ≤17 years was reported to reside in 39.4% of households. Of those households with children, 15.9% (95% CI=14.2%–17.6%) had a child with asthma. Overall, 10.1% of children ever had asthma: 7.8% of those aged <5 years, 9.5% of those aged 5–12 years, and 12.8% of those aged 13–17 years. The number of children with asthma was an estimated 151,000 (95% CI=139,000–165,000).

For children with asthma, results varied by socioeconomic status, family history, and whether the respondent was a current smoker. Compared with households with an annual income >$20,000, poorer households had higher asthma prevalence, with a rate ratio of 1.9 among children aged <5 years. When the respondent self-reported asthma, the prevalence of asthma in household children was 34% ($p<0.001$), compared with 14% when the respondent did not report asthma. In those households in which the respondent reported being a current smoker, 20.0% contained a child with asthma compared with 14.9% ($p=0.04$) of other households.

Reported by: SC Macdonald, PhD, LS Bensley, PhD, J VanEenwyk, PhD, Acting State Epidemiologist, Office of Epidemiology; K Wynkoop Simmons, PhD, Washington State Dept of Health.

Asthma — Continued

Air Pollution and Respiratory Health Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.

Editorial Note: Multiple factors affect the risk for asthma and the development for subsequent morbidity and mortality. The public health approach to asthma requires a multidisciplinary solution that includes environmental health issues such as outdoor air pollution (industrial and domestic [such as wood smoke]), indoor air quality (environmental tobacco smoke and allergens), and community health education for parents, day care centers and schools; occupational health programs to address workplace asthma (*2*); and health services delivery to ensure quality of care (biomedical and psychosocial) and access to adequate ambulatory primary care. In 1997, six states reported using various sources of data for public health surveillance of asthma: hospitalization data (four states), mortality data (four states), BRFSS (two states), and clinician reporting (one state) (*3*).

As public health surveillance systems evolve from those focused primarily on infectious diseases to systems focused on the full range of public health problems, new surveillance methods are being developed and adopted (*4,5*). Surveillance programs for asthma face challenges in developing diverse systems to address these various information needs (*6,7*). BRFSS is large, flexible, and yields data that can be compared across states and can be used to measure trends over time.

CDC developed a two-item BRFSS module on asthma for 1999, consistent with the standard 1998 surveillance case definition for asthma (*8*). This module is in use in 14 states, Puerto Rico, and Washington, DC. The items ask "Did a doctor ever tell you that you had asthma?" and "Do you still have asthma?" Previously, states have included asthma items as state-added questions (*3*).

The findings in this report are subject to at least four limitations. First, the BRFSS telephone survey method excludes non-English speakers and households without telephones; these households may have different rates of asthma. Second, reporting of asthma in children by proxy may be imperfect; the respondent is not necessarily the parent, and, even if a parent, may be the less knowledgeable parent. However, because of the dramatic symptoms of asthma, most persons are aware of the condition in the household. Third, the statewide prevalence data from BRFSS need to be supplemented by local survey data to optimize targeting of programs for asthma prevention and control. Finally, Washington measured "ever asthma" rather than "current asthma," as is done by the CDC module. However, the higher prevalence of fair or poor health in adults reporting "ever asthma" indicates that asthma persists for many of these persons. In addition, for the youngest children, "ever asthma" and "current asthma" are probably similar.

The prevalences reported for Washington are somewhat higher than national data previously reported from the National Health Interview Survey (NHIS) in 1998 (*1*). During 1993–1994, NHIS data showed an estimated average annual rate of self-reported asthma during the preceding 12 months ranging from 4.5% in older adults to 5.8% in children aged 0–4 years and 7.4% in children aged 5–14 years. The prevalences reported for Washington are somewhat higher than those forecast for the state using synthetic estimation methods based on NHIS data (*9*). The differences in estimates may be a result of increasing prevalence over time, differences between survey methods, and higher incidence or greater duration in Washington. The differences do not result from racial distribution: blacks, who have higher rates of asthma in NHIS data,

Asthma — Continued

are underrepresented in Washington, accounting for 3.1% of the population in 1990, compared with 12% nationally.

Washington has adopted the CDC module for its 1999 BRFSS and has modified its child asthma items to ask about "current asthma." The module is available on the World-Wide Web at http://www.doh.wa.gov/EHSPHL/Epidemiology/NICE.* Use of these types of surveys to ascertain the prevalence of asthma is an important component in the public health approach to asthma. To facilitate pooling and comparing data across states and regions, states should consider using uniform or comparable questions.

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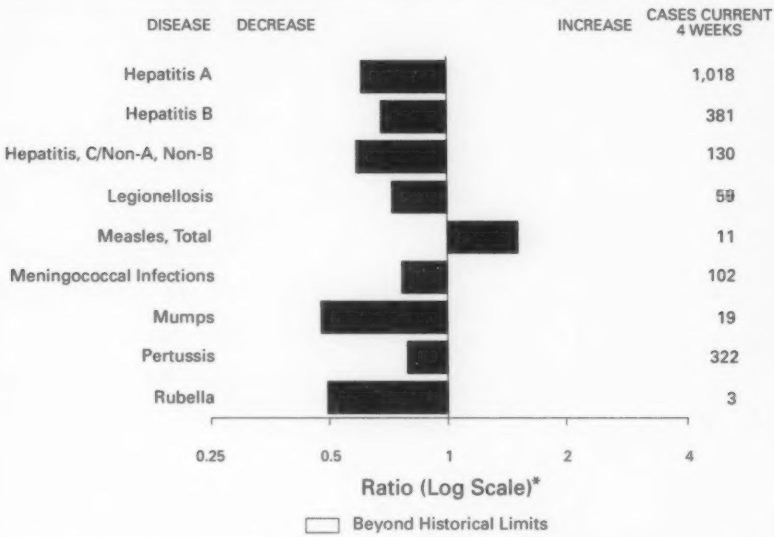
*References to sites of non-CDC organizations on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending October 9, 1999, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — provisional cases of selected notifiable diseases, United States, cumulative, week ending October 9, 1999 (40th Week)

		Cum. 1999		Cum. 1999
Anthrax		-	HIV infection, pediatric*§	109
Brucellosis*		38	Plague	5
Cholera		5	Poliomyelitis, paralytic	-
Congenital rubella syndrome		4	Psittacosis*	16
Cyclosporiasis*		47	Rabies, human	-
Diphtheria		4	Rocky Mountain spotted fever (RMSF)	422
Encephalitis:	California*	35	Streptococcal disease, invasive Group A	1,642
	eastern equine*	5	Streptococcal toxic-shock syndrome*	30
	St. Louis*	2	Syphilis, congenital¶	146
	western equine*	-	Tetanus	30
Ehrlichiosis	human granulocytic (HGE)*	117	Toxic-shock syndrome	91
	human monocytic (HME)*	33	Trichinosis	8
Hansen Disease*		71	Typhoid fever	246
Hantavirus pulmonary syndrome*†		16	Yellow fever	-
Hemolytic uremic syndrome, post-diarrheal*		73		

-:no reported cases
*Not notifiable in all states.
† Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§ Updated monthly from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention (NCHSTP), last update September 26, 1999.
¶ Updated from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

Reporting Area	AIDS		Chlamydia		Cryptosporidiosis		*Escherichia coli* O157:H7*			
							NETSS		PHLIS	
	Cum. 1999†	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998
UNITED STATES	34,088	35,254	437,542	450,964	1,698	3,055	2,476	2,312	1,562	1,830
NEW ENGLAND	1,698	1,354	15,377	15,780	112	131	257	278	229	235
Maine	54	24	738	757	21	28	31	33	-	-
N.H.	36	25	737	764	15	14	26	40	27	42
Vt.	13	17	363	324	32	21	26	18	14	16
Mass.	1,116	684	7,069	6,460	42	61	149	128	115	133
R.I.	77	98	1,774	1,756	2	7	25	11	6	1
Conn.	402	506	4,696	5,719	-	-	U	48	67	43
MID. ATLANTIC	8,684	9,591	49,741	46,970	262	467	209	253	60	81
Upstate N.Y.	952	1,103	N	N	121	279	160	184	-	-
N.Y. City	4,588	5,419	21,963	20,322	109	167	7	11	15	12
N.J.	1,619	1,753	7,929	9,026	22	21	42	58	32	48
Pa.	1,525	1,316	19,849	17,622	10	N	N	N	13	21
E.N. CENTRAL	2,280	2,565	62,199	76,279	389	609	518	370	384	308
Ohio	345	549	18,054	20,373	45	59	169	99	151	59
Ind.	258	412	7,898	8,470	33	50	74	81	45	42
Ill.	1,108	986	20,939	20,741	17	70	178	99	81	71
Mich.	456	466	15,308	16,069	41	33	97	91	65	61
Wis.	113	152	U	10,626	253	397	N	N	42	75
W.N. CENTRAL	770	661	25,421	26,704	178	240	502	384	277	351
Minn.	138	135	5,396	5,405	67	79	200	167	142	191
Iowa	69	58	3,104	3,411	51	60	100	80	57	50
Mo.	370	310	8,595	9,640	23	20	39	38	53	54
N. Dak.	6	4	325	776	16	27	16	10	1	15
S. Dak.	14	13	1,174	1,184	6	19	38	22	13	31
Nebr.	60	60	2,601	2,074	14	30	88	39	-	-
Kans.	113	81	4,226	4,214	1	5	21	28	11	10
S. ATLANTIC	9,423	9,157	92,123	86,787	301	249	260	187	139	148
Del.	129	112	1,968	1,974	-	3	6	-	3	2
Md.	1,113	1,300	7,844	5,736	13	17	23	34	2	14
D.C.	412	690	N	N	8	7	-	1	U	U
Va.	608	687	10,637	10,847	21	19	62	N	48	48
W. Va.	53	68	1,204	1,856	3	1	9	8	6	8
N.C.	629	637	17,403	16,876	15	N	55	45	46	44
S.C.	797	598	9,494	13,505	-	-	19	10	14	8
Ga.	1,382	979	21,374	17,983	115	83	27	61	-	-
Fla.	4,300	4,086	22,199	18,010	126	119	59	28	20	24
E.S. CENTRAL	1,536	1,440	35,498	31,267	24	20	100	100	53	55
Ky.	214	221	5,796	4,859	6	8	31	31	-	-
Tenn.	588	519	10,810	10,403	6	7	43	44	33	35
Ala.	405	395	10,007	7,723	10	N	21	20	16	18
Miss.	329	305	8,885	8,282	2	5	5	5	4	2
W.S. CENTRAL	3,524	4,187	65,019	68,721	65	862	74	80	81	87
Ark.	132	159	4,690	3,021	1	6	11	9	8	10
La.	663	705	10,879	11,243	22	14	9	4	11	6
Okla.	101	238	5,853	7,687	9	N	20	13	12	6
Tex.	2,628	3,085	43,597	46,770	33	842	34	54	50	65
MOUNTAIN	1,343	1,230	24,106	25,056	82	116	233	299	94	211
Mont.	8	23	1,133	1,009	10	10	17	15	-	5
Idaho	19	19	1,309	1,533	7	17	35	35	8	23
Wyo.	10	1	600	530	1	2	14	52	5	55
Colo.	235	230	4,784	6,193	11	16	87	64	40	50
N. Mex.	74	178	2,943	2,668	37	44	9	17	5	16
Ariz.	697	501	9,238	8,896	9	18	25	41	16	26
Utah	116	101	1,641	1,653	N	N	32	61	18	21
Nev.	184	177	2,458	2,574	7	9	14	14	2	15
PACIFIC	4,830	5,069	68,058	73,400	285	361	323	361	245	354
Wash.	285	331	9,097	8,599	N	N	131	78	104	104
Oreg.	151	138	4,734	4,230	86	62	64	94	61	90
Calif.	4,319	4,452	50,531	57,150	199	296	119	185	71	147
Alaska	13	17	1,463	1,461	-	-	1	4	-	-
Hawaii	62	131	2,173	1,960	-	3	8	-	9	13
Guam	5	-	226	307	-	-	N	N	U	U
P.R.	1,013	1,244	U	U	-	N	5	5	U	U
V.I.	25	24	U	U	U	U	U	U	U	U
Amer. Samoa	-	-	U	U	U	U	U	U	U	U
C.N.M.I.	-	-	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Individual cases may be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).

†Updated monthly from reports to the Division of HIV/AIDS Prevention–Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, last update September 26, 1999.

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

Reporting Area	Gonorrhea		Hepatitis C/NA,NB		Legionellosis		Lyme Disease	
	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998
UNITED STATES	240,425	268,683	2,562	2,574	656	1,006	8,494	12,901
NEW ENGLAND	4,650	4,667	58	53	55	64	2,946	4,062
Maine	42	52	2	-	4	1	34	68
N.H.	87	71	-	-	6	4	11	35
Vt.	37	32	5	4	12	5	18	11
Mass.	1,954	1,687	48	46	16	30	927	643
R.I.	457	290	3	3	7	15	350	424
Conn.	2,073	2,535	-	-	10	9	1,606	2,881
MID. ATLANTIC	29,061	29,055	107	172	128	252	4,144	7,002
Upstate N.Y.	5,080	5,438	72	86	48	77	3,011	3,317
N.Y. City	9,463	9,161	-	-	9	32	29	195
N.J.	4,988	6,077	-	U	13	15	390	1,514
Pa.	9,530	8,379	35	86	58	128	714	1,976
E.N. CENTRAL	41,608	52,670	1,290	555	182	332	99	667
Ohio	10,823	13,187	3	7	59	102	64	35
Ind.	4,339	4,981	1	5	31	58	19	31
Ill.	15,724	17,258	36	37	10	45	10	13
Mich.	10,722	12,419	659	377	53	68	1	12
Wis.	U	4,825	591	129	29	59	5	576
W.N. CENTRAL	10,467	13,151	149	34	38	56	173	186
Minn.	2,072	2,054	7	9	6	6	115	141
Iowa	830	1,149	-	8	11	9	18	23
Mo.	4,448	6,879	131	12	14	14	17	11
N. Dak.	31	63	-	-	1	-	1	-
S. Dak.	132	183	-	-	2	3	-	-
Nebr.	1,128	856	5	3	4	17	10	3
Kans.	1,826	1,967	6	2	-	7	12	8
S. ATLANTIC	68,883	72,323	175	87	104	113	875	743
Del.	1,229	1,141	1	-	10	11	25	57
Md.	6,299	6,949	36	10	23	28	630	539
D.C.	2,969	3,400	1	-	3	6	3	4
Va.	7,074	7,228	10	11	26	16	95	55
W. Va.	363	682	17	6	N	N	15	10
N.C.	15,361	14,756	33	19	13	11	63	48
S.C.	5,545	8,579	22	5	7	10	5	4
Ga.	14,359	15,374	1	9	1	8	-	5
Fla.	15,684	14,214	54	27	21	23	39	21
E.S. CENTRAL	28,557	30,170	214	241	35	54	69	91
Ky.	2,631	2,804	15	18	18	26	8	21
Tenn.	8,749	9,098	81	144	14	16	30	41
Ala.	9,044	9,989	2	4	3	5	18	16
Miss.	8,133	8,279	116	75	-	7	13	13
W.S. CENTRAL	36,592	42,171	178	423	6	27	28	19
Ark.	2,452	3,122	11	15	-	1	4	6
La.	8,653	9,554	102	68	2	2	-	4
Okla.	2,877	4,191	14	12	3	12	4	2
Tex.	22,610	25,304	51	328	1	12	20	7
MOUNTAIN	7,016	6,959	118	315	40	59	16	12
Mont.	34	32	5	7	-	2	-	-
Idaho	65	138	6	86	2	2	5	3
Wyo.	23	26	37	76	-	1	3	1
Colo.	1,786	1,604	19	23	11	14	-	-
N. Mex.	597	648	7	77	1	2	1	4
Ariz.	3,330	3,197	30	8	5	14	-	-
Utah	163	182	6	19	15	18	5	-
Nev.	1,018	1,132	8	19	6	6	2	4
PACIFIC	13,591	17,517	273	694	68	49	144	119
Wash.	1,570	1,507	13	19	11	9	7	7
Oreg.	692	618	17	16	N	N	11	17
Calif.	10,782	14,746	243	605	56	38	126	94
Alaska	238	247	-	-	1	1	-	1
Hawaii	309	399	-	54	-	1	N	N
Guam	32	50	-	1	-	2	-	1
P.R.	215	294	-	-	-	-	N	N
V.I.	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

Reporting Area	Malaria		Rabies, Animal		Salmonellosis*			
					NETSS		PHLIS	
	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998
UNITED STATES	979	1,146	4,586	5,920	27,463	32,004	21,513	27,144
NEW ENGLAND	49	47	694	1,187	1,326	1,936	1,382	1,845
Maine	3	3	132	197	114	141	83	52
N.H.	2	5	44	70	112	152	118	193
Vt.	4	1	83	53	77	103	71	81
Mass.	15	16	164	414	937	1,076	718	1,096
R.I.	4	4	74	77	86	107	52	34
Conn.	21	18	197	376	U	357	340	389
MID. ATLANTIC	220	347	858	1,274	3,121	5,223	2,905	4,860
Upstate N.Y.	56	75	642	893	1,028	1,274	860	1,144
N.Y. City	99	198	U	U	1,059	1,575	803	1,286
N.J.	44	48	143	168	508	1,112	535	1,109
Pa.	21	26	73	213	526	1,262	707	1,321
E.N. CENTRAL	92	123	131	110	4,086	5,067	2,698	3,845
Ohio	18	14	31	51	998	1,206	830	939
Ind.	18	10	12	9	404	551	322	439
Ill.	20	50	9	N	1,312	1,570	399	1,205
Mich.	31	40	76	31	776	923	747	836
Wis.	5	9	3	19	596	817	400	426
W.N. CENTRAL	61	75	579	593	1,785	1,823	1,704	1,892
Minn.	33	42	88	96	525	429	563	517
Iowa	12	7	135	129	220	310	158	247
Mo.	12	14	12	34	536	503	731	695
N. Dak.	-	2	125	119	41	48	4	65
S. Dak.	-	-	129	134	75	93	58	101
Nebr.	-	1	3	7	169	152	-	32
Kans.	4	9	87	74	219	288	190	235
S. ATLANTIC	278	233	1,677	1,950	6,537	6,295	4,153	4,815
Del.	1	3	34	38	107	66	120	103
Md.	78	66	322	381	699	732	725	711
D.C.	16	15	-	-	62	62	U	U
Va.	55	48	437	467	1,044	870	789	720
W. Va.	2	2	90	63	126	120	126	123
N.C.	24	23	345	484	949	902	1,051	1,098
S.C.	15	5	119	117	530	457	349	428
Ga.	21	32	178	247	1,034	1,236	651	1,191
Fla.	66	39	152	153	1,986	1,850	342	441
E.S. CENTRAL	21	25	218	234	1,464	1,757	814	1,280
Ky.	7	5	32	27	319	294	-	124
Tenn.	7	13	78	122	324	458	429	564
Ala.	6	5	108	83	471	538	308	475
Miss.	1	2	-	2	350	467	77	117
W.S. CENTRAL	15	31	85	26	2,480	3,412	2,557	2,474
Ark.	2	1	14	26	492	440	120	298
La.	10	12	-	-	334	444	438	607
Okla.	2	3	71	N	344	368	212	165
Tex.	1	15	-	-	1,310	2,160	1,787	1,404
MOUNTAIN	39	54	165	213	2,385	2,021	1,563	1,716
Mont.	4	1	52	46	49	67	1	40
Idaho	3	7	-	N	82	93	56	76
Wyo.	1	-	40	55	50	57	22	50
Colo.	14	16	1	32	594	454	537	433
N. Mex.	2	12	8	5	281	249	208	217
Ariz.	9	8	52	43	758	633	627	594
Utah	3	1	7	26	419	281	59	122
Nev.	3	9	5	6	152	187	53	184
PACIFIC	204	211	179	333	4,279	4,470	3,737	4,417
Wash.	22	17	-	-	515	394	617	531
Oreg.	18	14	1	7	360	243	419	267
Calif.	156	174	171	303	3,082	3,576	2,457	3,360
Alaska	1	2	7	23	44	50	8	30
Hawaii	7	4	-	-	278	207	236	229
Guam	-	2	-	-	20	29	U	U
P.R.	-	-	47	40	255	578	U	U
V.I.	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases

*Individual cases may be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

	Shigellosis*				Syphilis (Primary & Secondary)		Tuberculosis	
	NETSS		PHLIS					
Reporting Area	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999†	Cum. 1998†
UNITED STATES	11,467	15,979	5,469	9,046	4,848	5,503	10,886	12,629
NEW ENGLAND	538	357	386	314	44	62	309	338
Maine	4	12	-	-	-	1	13	11
N.H.	15	15	14	18	-	2	10	-
Vt.	6	6	4	-	3	4	1	4
Mass.	492	237	315	226	26	35	187	192
R.I.	21	29	9	13	2	1	32	41
Conn.	U	58	44	57	13	19	66	90
MID. ATLANTIC	693	1,970	370	1,484	196	242	1,983	2,223
Upstate N.Y.	231	457	45	157	24	33	245	282
N.Y. City	220	600	82	542	67	55	1,069	1,094
N.J.	170	593	121	555	44	77	396	476
Pa.	72	320	122	230	61	77	273	371
E.N. CENTRAL	2,090	2,248	1,068	1,177	876	791	1,019	1,280
Ohio	353	414	111	102	69	113	194	189
Ind.	233	140	70	34	343	152	69	128
Ill.	813	1,224	592	986	312	332	459	601
Mich.	333	219	227	4	152	141	221	284
Wis.	358	251	68	51	U	53	76	78
W.N. CENTRAL	915	834	568	494	95	106	345	349
Minn.	200	257	194	288	9	6	122	114
Iowa	43	58	23	40	9	1	37	28
Mo.	560	102	312	79	60	81	134	133
N. Dak.	2	7	-	3	-	-	6	8
S. Dak.	11	30	5	21	-	1	12	16
Nebr.	62	334	-	19	7	4	15	11
Kans.	37	46	34	44	10	13	19	39
S. ATLANTIC	1,910	3,325	373	1,025	1,562	2,008	2,275	2,227
Del.	12	27	7	23	6	19	12	31
Md.	128	167	44	59	290	540	206	242
D.C.	45	23	U	U	54	69	34	86
Va.	105	162	43	74	121	120	203	222
W. Va.	8	11	4	7	2	2	33	31
N.C.	165	237	72	114	395	589	333	339
S.C.	106	144	51	64	212	240	206	227
Ga.	179	874	37	210	248	213	450	402
Fla.	1,162	1,680	115	474	234	216	798	647
E.S. CENTRAL	896	745	444	550	895	956	700	894
Ky.	211	100	-	45	81	81	148	131
Tenn.	508	218	387	306	498	448	257	281
Ala.	94	382	47	192	177	222	239	303
Miss.	83	45	10	7	139	205	56	179
W.S. CENTRAL	1,659	3,077	1,644	980	762	829	1,231	1,837
Ark.	71	162	23	53	57	90	135	105
La.	118	239	83	217	200	334	U	150
Okla.	419	327	128	86	145	70	100	139
Tex.	1,051	2,349	1,410	624	360	335	996	1,443
MOUNTAIN	824	972	456	597	178	202	318	415
Mont.	7	8	-	3	1	-	10	15
Idaho	21	18	7	13	1	2	14	7
Wyo.	3	3	1	1	-	1	3	4
Colo.	148	162	80	120	2	10	U	50
N. Mex.	101	233	59	132	9	22	48	49
Ariz.	418	473	294	290	157	151	175	157
Utah	51	37	9	28	2	3	31	45
Nev.	75	38	6	10	6	13	37	88
PACIFIC	1,942	2,451	160	2,425	240	307	2,706	3,066
Wash.	90	161	69	142	57	27	156	198
Oreg.	70	115	67	110	8	4	82	109
Calif.	1,754	2,137	-	2,137	171	272	2,293	2,578
Alaska	2	4	-	2	1	1	43	40
Hawaii	26	34	24	34	3	3	132	141
Guam	7	29	U	U	1	1	-	72
P.R.	62	46	U	U	121	146	41	122
V.I.	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases

*Individual cases may be reported through both the National Electronic Telecommunications System for Surveillance (NETSS) and the Public Health Laboratory Information System (PHLIS).

†Cumulative reports of provisional tuberculosis cases for 1999 are unavailable ("U") for some areas using the Tuberculosis Information System (TIMS).

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (Viral), by type A		Hepatitis (Viral), by type B		Measles (Rubeola) Indigenous		Imported*		Total	
	Cum. 1999†	Cum. 1998	Cum. 1999	Cum. 1998	Cum. 1999	Cum. 1998	1999	Cum. 1999	1999	Cum. 1999	Cum. 1999	Cum. 1998
UNITED STATES	913	847	11,878	17,427	4,948	7,533	-	50	-	22	72	75
NEW ENGLAND	73	57	214	232	73	158	-	6	-	4	10	3
Maine	5	2	8	16	1	2	-	-	-	-	-	-
N.H.	16	9	15	10	13	14	-	-	-	1	1	-
Vt.	5	6	16	14	2	7	-	-	-	-	-	1
Mass.	27	34	62	102	30	57	-	5	-	2	7	2
R.I.	4	5	14	14	27	52	-	-	-	-	-	-
Conn.	16	1	99	76	-	26	-	1	-	1	2	-
MID. ATLANTIC	139	138	727	1,353	511	977	-	-	-	2	2	14
Upstate N.Y.	68	47	212	278	152	188	-	-	-	2	2	2
N.Y. City	31	37	209	472	157	341	-	-	-	-	-	-
N.J.	39	47	57	277	40	170	-	-	-	-	-	8
Pa.	1	7	249	326	162	278	-	-	-	-	-	4
E.N. CENTRAL	140	145	2,221	2,779	507	1,136	-	1	-	1	2	15
Ohio	50	44	538	256	77	63	-	-	-	-	-	1
Ind.	20	36	95	124	36	87	-	1	-	-	1	3
Ill.	59	50	490	627	1	196	-	-	-	-	-	-
Mich.	11	8	1,072	1,605	388	369	-	-	-	1	1	10
Wis.	-	7	26	167	5	421	-	-	-	-	-	1
W.N. CENTRAL	79	75	619	1,159	242	318	-	-	-	-	-	-
Minn.	38	58	61	101	41	35	-	-	-	-	-	-
Iowa	9	2	117	378	33	48	-	-	-	-	-	-
Mo.	23	8	341	544	126	190	-	-	-	-	-	-
N. Dak.	1	-	2	3	-	4	-	-	-	-	-	-
S. Dak.	1	-	8	21	1	2	U	-	U	-	-	-
Nebr.	3	1	50	25	14	17	-	-	-	-	-	-
Kans.	4	6	40	87	27	22	U	-	U	-	-	-
S. ATLANTIC	206	154	1,608	1,504	979	801	-	9	-	6	15	8
Del.	-	-	2	3	1	3	-	-	-	-	-	1
Md.	54	50	293	325	138	115	-	-	-	-	-	1
D.C.	4	-	54	48	21	10	-	-	-	-	-	-
Va.	15	15	133	172	74	84	-	9	-	3	12	2
W. Va.	6	5	31	6	22	8	-	-	-	-	-	-
N.C.	28	23	127	95	194	173	-	-	-	1	1	-
S.C.	5	3	40	32	63	31	-	-	-	-	-	-
Ga.	55	33	383	466	136	127	-	-	-	-	-	2
Fla.	39	25	545	357	330	250	-	-	-	2	2	2
E.S. CENTRAL	52	45	324	320	340	396	-	2	-	-	2	2
Ky.	6	7	55	26	33	38	-	2	-	-	2	-
Tenn.	28	26	142	186	170	220	-	-	-	-	-	1
Ala.	15	10	45	57	68	62	-	-	-	-	-	1
Miss.	3	2	82	51	69	76	-	-	-	-	-	-
W.S. CENTRAL	43	44	2,255	3,075	684	1,676	-	5	-	4	9	-
Ark.	2	-	44	72	36	88	-	-	-	-	-	-
La.	7	20	73	70	77	111	U	-	U	-	-	-
Okla.	30	22	379	466	103	71	-	-	-	-	-	-
Tex.	4	2	1,759	2,467	468	1,406	-	5	-	4	9	-
MOUNTAIN	92	94	1,052	2,648	471	670	-	3	-	-	3	-
Mont.	2	-	17	85	17	5	-	-	-	-	-	-
Idaho	1	-	35	208	25	32	-	-	-	-	-	-
Wyo.	1	1	7	33	12	7	-	-	-	-	-	-
Colo.	11	20	184	249	76	85	-	-	-	-	-	-
N. Mex.	18	5	41	119	148	263	-	-	-	-	-	-
Ariz.	49	46	615	1,607	126	149	-	1	-	-	1	-
Utah	7	3	39	160	27	60	-	2	-	-	2	-
Nev.	3	19	114	187	40	69	-	-	-	-	-	-
PACIFIC	89	95	2,858	4,357	1,141	1,401	-	24	-	5	29	33
Wash.	4	7	263	853	55	86	-	-	-	-	-	1
Oreg.	35	37	209	337	74	148	-	9	-	-	9	-
Calif.	38	41	2,366	3,101	987	1,143	-	15	-	4	19	7
Alaska	5	3	8	16	13	11	-	-	-	-	-	25
Hawaii	7	7	12	50	12	13	-	-	-	1	1	-
Guam	-	-	2	1	2	2	U	1	U	-	1	-
P.R.	1	2	112	51	102	195	U	-	U	-	-	-
V.I.	U	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases

*For imported measles, cases include only those resulting from importation from other countries.

†Of 170 cases among children aged <5 years, serotype was reported for 87 and of those, 23 were type b.

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending October 9, 1999, and October 10, 1998 (40th Week)

Reporting Area	Meningococcal Disease		Mumps			Pertussis			Rubella		
	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998	1999	Cum. 1999	Cum. 1998
UNITED STATES	1,861	2,083	9	257	540	60	4,122	4,923	2	224	338
NEW ENGLAND	91	90	-	4	6	1	486	793	-	7	38
Maine	5	5	-	-	-	-	-	5	-	-	-
N.H.	12	11	-	1	-	-	74	80	-	-	-
Vt.	4	5	-	1	-	1	53	66	-	-	-
Mass.	52	41	-	2	4	-	321	595	-	7	8
R.I.	4	3	-	-	-	-	24	9	-	-	1
Conn.	14	25	-	-	2	-	14	38	-	-	29
MID. ATLANTIC	167	218	-	28	176	3	684	493	-	22	146
Upstate N.Y.	51	56	-	9	5	3	598	259	-	18	114
N.Y. City	44	26	-	3	155	-	10	31	-	-	18
N.J.	39	51	-	-	6	-	12	15	-	1	13
Pa.	33	85	-	16	10	-	64	188	-	3	1
E.N. CENTRAL	321	320	2	32	67	11	315	624	-	2	-
Ohio	117	115	2	13	25	10	166	220	-	-	-
Ind.	53	56	-	4	6	-	54	113	-	1	-
Ill.	87	84	-	8	9	-	49	78	-	1	-
Mich.	40	38	-	7	25	1	42	56	-	-	-
Wis.	24	27	-	-	2	-	4	157	-	-	-
W.N. CENTRAL	206	182	-	11	28	17	289	407	-	123	32
Minn.	45	29	-	1	12	15	154	215	-	5	-
Iowa	37	33	-	5	10	2	41	60	-	29	-
Mo.	80	67	-	2	3	-	47	30	-	2	2
N. Dak.	3	5	-	-	2	-	4	3	-	-	-
S. Dak.	11	7	U	-	-	U	5	8	U	-	-
Nebr.	12	13	-	-	-	-	3	15	-	87	-
Kans.	18	28	U	3	1	U	35	76	U	-	30
S. ATLANTIC	327	344	-	42	42	9	335	264	-	36	18
Del.	7	2	-	-	-	-	4	5	-	-	-
Md.	46	25	-	3	-	1	95	51	-	1	1
D.C.	1	1	-	2	-	-	-	1	-	-	-
Va.	42	31	-	9	7	-	19	26	-	-	1
W. Va.	5	13	-	-	-	-	2	1	-	-	-
N.C.	36	48	-	8	10	-	83	89	-	35	13
S.C.	41	49	-	4	6	-	15	25	-	-	-
Ga.	52	79	-	4	1	1	34	21	-	-	-
Fla.	97	96	-	12	18	7	83	45	-	-	3
E.S. CENTRAL	118	161	-	11	13	1	69	102	-	1	2
Ky.	25	28	-	-	-	-	20	43	-	-	-
Tenn.	43	58	-	-	1	-	28	32	-	-	2
Ala.	29	41	-	8	7	1	18	23	-	1	-
Miss.	21	34	-	3	5	-	3	4	-	-	-
W.S. CENTRAL	147	248	-	30	53	1	140	310	1	12	87
Ark.	31	27	-	-	11	-	17	60	1	5	-
La.	34	50	U	3	6	U	3	7	U	-	-
Okla.	26	34	-	1	-	-	12	31	-	-	-
Tex.	56	137	-	26	36	1	108	212	-	7	87
MOUNTAIN	120	115	4	23	35	17	508	865	1	17	5
Mont.	2	4	-	-	-	-	2	9	-	-	-
Idaho	10	9	-	1	4	-	129	206	-	-	-
Wyo.	4	5	-	-	1	-	2	8	-	-	-
Colo.	30	22	1	5	6	9	146	200	1	2	-
N. Mex.	13	21	N	N	N	2	104	82	-	-	1
Ariz.	41	37	3	7	6	6	65	179	-	13	1
Utah	13	10	-	5	5	-	55	142	-	1	2
Nev.	7	7	-	5	13	-	5	39	-	1	1
PACIFIC	364	405	3	76	120	-	1,296	1,065	-	4	10
Wash.	59	58	-	2	8	-	581	262	-	-	5
Oreg.	61	68	N	N	N	-	41	73	-	-	-
Calif.	234	271	1	60	87	-	642	701	-	4	3
Alaska	5	3	1	2	2	-	4	14	-	-	-
Hawaii	5	5	1	12	23	-	28	15	-	-	2
Guam	1	2	U	1	3	U	1	1	U	-	-
P.R.	5	9	U	-	3	U	16	4	U	-	12
V.I.	U	U	U	U	U	U	U	U	U	U	U
Amer. Samoa	U	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	U	U	U	U	U	U	U	U	U	U	U

N: Not notifiable U: Unavailable -: no reported cases

TABLE IV. Deaths in 122 U.S. cities,* week ending October 9, 1999 (40th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	454	334	76	36	7	1	26
Boston, Mass.	147	100	27	16	4	-	8
Bridgeport, Conn.	36	30	4	1	1	-	1
Cambridge, Mass.	14	11	2	1	-	-	1
Fall River, Mass.	27	20	5	2	-	-	4
Hartford, Conn.	U	U	U	U	U	U	U
Lowell, Mass.	24	17	5	1	1	-	-
Lynn, Mass.	14	11	2	1	-	-	1
New Bedford, Mass.	13	8	2	2	-	1	-
New Haven, Conn.	27	23	3	1	-	-	1
Providence, R.I.	35	28	4	3	-	-	3
Somerville, Mass.	2	-	1	1	-	-	-
Springfield, Mass.	44	33	6	4	1	-	-
Waterbury, Conn.	18	17	1	-	-	-	1
Worcester, Mass.	53	36	14	3	-	-	6
MID. ATLANTIC	2,220	1,587	416	149	37	31	84
Albany, N.Y.	48	38	7	2	-	1	2
Allentown, Pa.	U	U	U	U	U	U	U
Buffalo, N.Y.	91	70	13	5	1	2	5
Camden, N.J.	20	11	5	1	-	3	-
Elizabeth, N.J.	13	13	-	-	-	-	1
Erie, Pa.	38	31	5	1	1	-	2
Jersey City, N.J.	20	14	4	-	1	1	-
New York City, N.Y.	1,182	840	223	82	18	19	26
Newark, N.J.	U	U	U	U	U	U	U
Paterson, N.J.	U	U	U	U	U	U	U
Philadelphia, Pa.	435	279	99	43	10	4	23
Pittsburgh, Pa.§	46	35	6	2	2	1	4
Reading, Pa.	30	25	2	2	1	-	1
Rochester, N.Y.	141	116	19	5	1	-	7
Schenectady, N.Y.	28	19	7	1	1	-	3
Scranton, Pa.	23	16	5	2	-	-	3
Syracuse, N.Y.	74	59	13	2	-	-	5
Trenton, N.J.	16	10	5	1	-	-	2
Utica, N.Y.	15	11	3	-	1	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	1,754	1,188	322	141	63	37	132
Akron, Ohio	51	35	7	7	2	-	2
Canton, Ohio	38	30	3	5	-	-	6
Chicago, Ill.	448	247	112	55	19	12	29
Cincinnati, Ohio	79	54	14	3	3	5	10
Cleveland, Ohio	121	81	21	14	4	1	3
Columbus, Ohio	194	126	37	20	7	4	16
Dayton, Ohio	103	75	19	5	1	3	8
Detroit, Mich.	U	U	U	U	U	U	U
Evansville, Ind.	22	20	2	-	-	-	1
Fort Wayne, Ind.	55	37	11	3	2	2	3
Gary, Ind.	16	11	3	-	1	1	1
Grand Rapids, Mich.	41	29	8	2	-	2	4
Indianapolis, Ind.	157	116	23	9	8	1	21
Lansing, Mich.	42	26	11	1	4	-	3
Milwaukee, Wis.	105	79	15	5	5	1	11
Peoria, Ill.	43	39	1	2	-	1	3
Rockford, Ill.	60	44	8	6	1	1	3
South Bend, Ind.	35	21	9	2	1	2	1
Toledo, Ohio	89	72	15	-	2	-	2
Youngstown, Ohio	55	46	3	2	3	1	5
W.N. CENTRAL	712	511	128	35	14	24	35
Des Moines, Iowa	136	93	28	9	1	5	8
Duluth, Minn.	37	24	8	2	1	2	2
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	99	75	15	2	3	4	6
Lincoln, Nebr.	31	24	4	2	-	1	2
Minneapolis, Minn.	162	123	26	9	3	1	6
Omaha, Nebr.	70	44	18	3	1	4	5
St. Louis, Mo.	77	50	14	3	4	6	1
St. Paul, Minn.	100	78	15	5	1	1	5
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,104	699	221	117	32	35	66
Atlanta, Ga.	U	U	U	U	U	U	U
Baltimore, Md.	175	85	38	35	8	9	14
Charlotte, N.C.	120	88	17	9	1	5	10
Jacksonville, Fla.	171	105	40	9	5	12	10
Miami, Fla.	74	61	3	7	3	-	12
Norfolk, Va.	53	32	14	4	1	2	3
Richmond, Va.	64	37	18	6	2	1	3
Savannah, Ga.	59	40	10	5	3	1	5
St. Petersburg, Fla.	59	49	4	2	2	2	3
Tampa, Fla.	177	114	38	18	4	3	2
Washington, D.C.	128	68	35	22	3	-	4
Wilmington, Del.	24	20	4	-	-	-	-
E.S. CENTRAL	859	571	165	72	31	19	71
Birmingham, Ala.	152	101	27	10	8	5	9
Chattanooga, Tenn.	68	45	15	7	1	-	2
Knoxville, Tenn.	98	63	23	8	2	2	8
Lexington, Ky.	72	52	10	7	2	1	5
Memphis, Tenn.	252	159	53	18	13	9	27
Mobile, Ala.	54	37	7	8	2	-	2
Montgomery, Ala.	53	36	10	5	2	-	9
Nashville, Tenn.	110	78	20	9	1	2	9
W.S. CENTRAL	1,377	859	310	113	42	53	88
Austin, Tex.	76	44	19	10	2	1	2
Baton Rouge, La.	44	27	12	3	1	1	3
Corpus Christi, Tex.	37	24	8	1	2	2	2
Dallas, Tex.	175	100	36	23	4	12	6
El Paso, Tex.	82	53	22	4	2	1	4
Ft. Worth, Tex.	124	79	23	9	3	10	9
Houston, Tex.	391	235	95	32	16	13	28
Little Rock, Ark.	67	45	16	3	2	1	5
New Orleans, La.	41	21	8	7	2	3	6
San Antonio, Tex.	201	138	42	10	7	4	12
Shreveport, La.	47	30	7	6	1	3	5
Tulsa, Okla.	92	63	22	5	-	2	6
MOUNTAIN	1,004	670	205	84	28	17	86
Albuquerque, N.M.	122	89	14	14	3	2	11
Boise, Idaho	43	29	9	3	1	1	2
Colo. Springs, Colo.	55	36	8	8	2	1	4
Denver, Colo.	134	90	30	10	2	2	10
Las Vegas, Nev.	177	108	48	14	6	1	8
Ogden, Utah	42	30	8	3	1	-	5
Phoenix, Ariz.	163	94	38	15	10	6	16
Pueblo, Colo.	27	18	7	2	-	-	1
Salt Lake City, Utah	112	74	23	10	2	3	19
Tucson, Ariz.	129	102	20	5	1	1	10
PACIFIC	1,513	1,091	262	97	42	21	128
Berkeley, Calif.	19	14	4	1	-	-	-
Fresno, Calif.	88	62	13	8	5	-	5
Glendale, Calif.	21	18	2	1	-	-	-
Honolulu, Hawaii	57	46	6	3	1	1	7
Long Beach, Calif.	67	43	12	5	5	2	6
Los Angeles, Calif.	367	267	68	18	9	5	24
Pasadena, Calif.	22	13	4	2	1	2	2
Portland, Oreg.	141	104	26	7	1	3	15
Sacramento, Calif.	180	130	31	10	5	4	24
San Diego, Calif.	130	89	23	11	4	3	7
San Francisco, Calif.	U	U	U	U	U	U	U
San Jose, Calif.	126	86	25	9	6	-	19
Santa Cruz, Calif.	25	20	5	-	-	-	1
Seattle, Wash.	148	110	20	13	4	1	8
Spokane, Wash.	60	46	11	3	-	-	6
Tacoma, Wash.	62	43	12	6	1	-	4
TOTAL	10,997¶	7,510	2,105	844	296	238	716

U: Unavailable -: no reported cases

*Mortality data in this table are voluntarily reported from 122 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

Contributors to the Production of the *MMWR* (Weekly)
Weekly Notifiable Disease Morbidity Data and 122 Cities Mortality Data

Samuel L. Groseclose, D.V.M., M.P.H.

State Support Team
Robert Fagan
Jose Aponte
Paul Gangarosa, M.P.H.
Gerald Jones
David Nitschke
Carol A. Worsham

CDC Operations Team
Carol M. Knowles
Deborah A. Adams
Willie J. Anderson
Fredrick Browder
Patsy A. Hall
Kathryn Snavely

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control and Prevention, Atlanta, Georgia. This edition is printed and distributed by the Massachusetts Medical Society, publishers of *The New England Journal of Medicine*.

Data in the *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at the close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday.

Address inquiries about the content of the *MMWR* Series, including reports submitted for publication, to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, CDC, 1600 Clifton Road, N.E., Atlanta, Georgia 30333; telephone (888) 232-3228.

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The *Morbidity and Mortality Weekly Report* (ISSN 0149-2195) is published weekly by the Massachusetts Medical Society, 860 Winter Street, Waltham, MA 02451 under the terms of a non-exclusive agreement with the Centers for Disease Control and Prevention. Subscription Price: $79.00 per year. Periodicals postage paid at Boston MA. Postmaster: Send address changes to P.O. Box 54803, Waltham, MA 02454-0803.

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Waltham, MA 02454-9120

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